

Application No. 10/775,096  
Reply to Office Action dated May 11, 2007

IN THE DRAWINGS

The attached sheet of drawings includes changes to Fig. 2. This sheet, which includes Fig. 2, replaces the original sheet including Fig. 2.

Attachment: Replacement Sheet (1)

REMARKS/ARGUMENTS

Favorable reconsideration of this application in light of the following discussion is respectfully requested.

Claims 1 and 2 are pending in the application. No claim amendments are presented, thus, no new matter is added.

In the outstanding Office Action, the drawings were objected to because of a minor informality; Claim 1 was rejected under 35 U.S.C. §102(e) as anticipated by DiGiovanni et al. (U.S. Patent No. 6,735,985, hereinafter DiGiovanni); and Claim 1 was rejected under 35 U.S.C. §103(a) as unpatentable over Roba et al. (U.S. Publication No. 2001/0020374, hereinafter Roba) in view of Chen et al. (U.S. Patent No. 6,876,804, hereinafter Chen).

In response to the objection to the drawings, Fig. 2 is amended to include the Legend "Background Art." Accordingly, Applicant respectfully requests that the objection to the drawings be withdrawn.

In response to the rejection of Claim 1 under 35 U.S.C. §102 and 35 U.S.C. §103, Applicants respectfully submit that independent Claim 1 recites novel features clearly not taught or rendered obvious by the applied references.

Independent Claim 1 recites a method of manufacturing an optical fiber, the optical fiber comprising a core and a cladding and having a maximum relative refractive index difference of the core with the cladding of 0.3% to 0.5% and a mode field diameter of 8 micrometers to 10 micrometers at a wavelength of 1310 nanometers. The method includes heating at least a portion of an optical fiber preform, and drawing an optical fiber at a speed of 500 meters per minute or more from the optical fiber preform heated. Independent Claim 1 further recites that the method comprises:

...impressing a spin on the optical fiber, while drawing, alternately in a clockwise direction and in a counterclockwise direction with a predetermined angle in such a manner that a

maximum spatial frequency "y" of the spin per meter satisfies a relationship of

$$\exp(24x-12) \leq y \leq 4$$

*where "x" is non-circularity of the cladding in percent, and that a polarization mode dispersion of the optical fiber manufactured is  $0.5 \text{ ps/km}^{1/2}$  or less at the wavelength of 1310 nanometers.*

Claim 1 was rejected under 35 U.S.C. §102(e) as anticipated by DiGiovanni.

Applicant respectfully submits that DiGiovanni fails to teach or suggest all the features recited in independent Claim 1.

DiGiovanni describes a technique for drawing a circular core multimode optical fiber using twist during draw to increase fiber bandwidth.<sup>1</sup> DiGiovanni, however, fails to teach or suggest the close relationship between the non-circularity of the **cladding** and the polarization mode dispersion (PMD) of the optical fiber, as recited in independent Claim 1.

In addressing this claimed feature, the Office Action cites col. 4, lines 7-8 and col. 5, lines 1-2 of DiGiovanni. These cited portions of DiGiovanni describe that the twist is alternated between a left hand twist and a right hand twist, and rotations are complete 360 degree rotations so a prescription for, e.g., 4 twists per meter, would involve 2.5 rotations in each direction. DiGiovanni further describes that the twists are performed on a silica based optical fiber having a circular core and a cladding, with the core having a larger effective refractive index than cladding material that surrounds the core. DiGiovanni, however, fails to teach or suggest taking the non-circularity of the cladding into account when spinning the optical fiber to achieve a particular PMD, as recited in independent Claim 1.

DiGiovanni, specifically, fails to teach or suggest impressing a spin on the optical fiber in such a manner that the that a maximum spatial frequency "y" of the spin per meter satisfies a relationship of " $\exp(24x-12) \leq y \leq 4$  where "x" is non-circularity of the cladding in

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<sup>1</sup> DiGiovanni, Abstract.

***percent, and that a polarization mode dispersion of the optical fiber manufactured is 0.5 ps/km<sup>1/2</sup> or less at the wavelength of 1310 nanometers,” as recited in independent Claim 1.***

Accordingly, Applicant respectfully requests that the rejection of Claim 1 under 35 U.S.C. §102 be withdrawn.

Claim 1 was rejected under 35 U.S.C. §103(a) as unpatentable over Roba in view of Chen. At p. 4, the Office Action admits that Roba fails to disclose “a particular spin frequency achieved in impressing spin on the fiber.” In an attempt to remedy this deficiency, the Office Action relies on Chen and states that it would have been obvious to one of ordinary skill in the art at the time of the invention to combine the references to arrive at Applicant’s claims. In response to this rejection, Applicant respectfully submits that Chen fails to teach or suggest the claimed features for which it is relied upon as a secondary reference under 35 U.S.C. §103.

In addressing the above noted features of independent Claim 1, the Office Action relies on col. 3, lines 4-10 and col. 2, lines 41-45 of Chen. These cited portions of the Chen describe that a peak fiber spin rate is greater than 1.5 revolutions per meter, and more preferably between 1.2 and 4 revolutions per meter. Chen further describes that his method is used to produce an optical fiber having a PMD on the order of less than 0.05 ps/km<sup>1/2</sup>.

Neither Chen, nor Roba, however, teach or suggest taking the non-circularity of the cladding into account when spinning the optical fiber to achieve a particular PMD, as recited in independent Claim 1. Specifically, neither reference, alone or in combination, teaches or suggests impressing a spin on the optical fiber in such a manner that the that a maximum spatial frequency "y" of the spin per meter satisfies a relationship of “***exp(24x-12) ≤ y ≤ 4 where "x" is non-circularity of the cladding in percent, and that a polarization mode dispersion of the optical fiber manufactured is 0.5 ps/km<sup>1/2</sup> or less at the wavelength of 1310 nanometers,” as recited in independent Claim 1.***

Accordingly, Applicant respectfully requests that the rejection of Claim 1 under 35 U.S.C. §103 be withdrawn.

Consequently, in view of the present amendment and in light of the foregoing comments, it is respectfully submitted that the invention defined by Claims 1 and 2 is patentably distinguishing over the applied references. The present application is therefore believed to be in condition for formal allowance and an early and favorable reconsideration of the application is therefore requested.

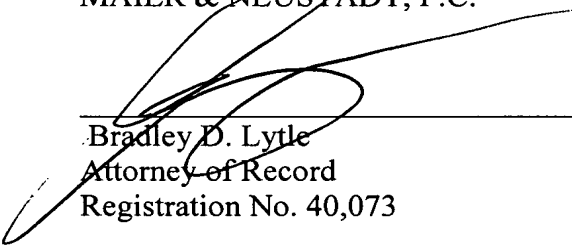
Respectfully submitted,

OBLON, SPIVAK, McCLELLAND,  
MAIER & NEUSTADT, P.C.

Customer Number

**22850**

Tel: (703) 413-3000  
Fax: (703) 413 -2220  
(OSMMN 06/04)



Bradley D. Lytle  
Attorney of Record  
Registration No. 40,073

Andrew T. Harry  
Registration No. 56,959